

Use of Management Tools in Health Planning

MARY F. ARNOLD, Dr.P.H.

HEALTH PROFESSIONALS are taught to be objective, plan rationally, set objectives, evaluate, and assess all elements of a problem. But we have found that problems are never neatly arranged for rational analysis, and time for planning disappears under the pressure of numerous emergencies. Nevertheless, we in public health have challenged ourselves, through the Commission on Community Health Services, to cope rationally with an array of health-related activities so diverse that the Commission's recommendations themselves are internally inconsistent. We have challenged ourselves to plan rationally in a milieu of political jurisdictions developed for an agrarian economy, and to compound our dilemmas, we have been challenged by Congress with the passage of Public Laws 89-749 and 89-239 simultaneously to organize, develop, and implement effective plans for dealing with current and future health problems at every level of an expanding society.

These challenges are formidable, and we will not be able to meet them by merely reshuffling old activities. We will have to change organizational structures, learn new tools and technologies, and develop new ways of thinking about

Dr. Arnold is lecturer in public health administration at the University of California, Berkeley. This paper is adapted from a paper presented at the Symposium on Program Planning, Budgeting and Evaluation in Public Health, Fels Institute, Philadelphia, June 5-7, 1967.

the value of health. All these changes will be traumatic, for they will add new uncertainties to a world that already has too many for comfort and security.

The Meaning of Planning

To some people planning means specifying a plan of action; to others, determining the most efficient allocation of resources; to still others, identifying the means by which we determine the kind of future we want (1, 2). Sometimes the term "planning" infers managerial planning within a circumscribed system such as an agency; at other times, planning for an open system such as a State or nation.

There is one factor common to all these approaches—the application of scientific reasoning to problem solving. This reasoned problem solving involves analysis of causality, prediction of outcomes with some order of preference, and a conscious rational choice from among alternative actions.

To have meaning, these general ideas about scientific reasoning must be considered in terms of the specific kinds of planning we expect to do. Thus, much of the confusion in the meaning of the term "planning" is related to the situation in which we expect to operate.

Another aspect to this confusion is in the changing modes of scientific thought permeating all fields. Just as in the health field we are beginning to take an ecological approach to the study of man in his environment, we are chang-

ing our ways of thinking about phenomena ranging from the atom to social organization (3). These changes in ways of thinking, coupled with our expanding knowledge from science and technology, have increased our uncertainties about planning at the very time we wish to plan rationally to solve the problems of the health system.

One result of these changes has been the development of a new array of technical management planning tools that are too often seen as panaceas for all the problems of planning (4). To begin to understand the issues of planning, it is useful to look at what has happened to organizational planning and how these tools fit into the scheme of things.

Changes in Organizational Concepts

The field of administrative management has recently entered a new phase of conceptualization in an attempt "to graft modern scientific thought onto the empiricism which has largely served it in the past" (5). These new approaches to management have affected how we think about planning. The first movement toward developing a science of management came in the early part of this century and emphasized structure on the assumption that all tasks could be divided into separable and discrete units. A rational organization was a logical one in which there was a clear-cut division of labor, with a hierarchial authority structure. Through such works as those of Mary Parker Follett and the Hawthorne studies, we soon learned that the social process within an organization must be considered, and on the basis of broad generalizations from a few studies, we fixed on motivation and began to emphasize process rather than structure.

Reconciliation of process and structure orientation, however was very difficult, and it was not until some new scientific concepts from mathematics and engineering were set forth in the late 1940's that new ways of thinking about organizations advanced to the point at which we could begin to combine our knowledge about both process and structure.

With developments in cybernetics, information, and systems theories, two new approaches to the real world of management evolved—the dynamic model and an output orientation. The

idea of system, of feedback, evaluation, and control is a dynamic concept and assumes change, forcing us to think in terms of a dynamic rather than static equilibrium. This shift to dynamic constructs starts with the new assumption that the whole is made of interacting rather than discrete parts and that the output of the system is the important variable. Thus, within the past 50 years administrative thinking has shifted from a focus on a rationality of structure, through an emphasis on social process and interpersonal relationships, to an orientation to mission or task.

We can see evidence of these shifts in the American Public Health Association's standards for local health departments. From the Emerson report in 1945, which set the structural pattern for local health departments with the "basic six," we moved in 1951 to a focus on process—"supervision and regulation, recording and analysis of data, operation, coordination" (6). In 1964 we began to shift toward an output orientation with the functions listed as "promotion of personal and community health, maintenance of environment, and an aggressive attack on disease and disability" (7). The current emphasis on comprehensive health planning is a continuation of this change. However, most of the public health agencies of this country have been caught up in the rigidities of legislated structures and are still bound into a rigid, bureaucratic organizational pattern that was logical under the old structural orientation.

Burns and Stalker suggest that such a bureaucratic organization, called mechanistic, is characterized by specialized differentiation of tasks, precise definition of rights, duties, and obligations regarding responsibilities of position, and hierarchical control, authority, and communication (8). This mechanistic type of structure leads to an emphasis on means rather than ends or objectives, and is therefore appropriate for a stable, repetitive situation. But Burns and Stalker suggest that under conditions of change and uncertainty, an organic form of organization is more appropriate.

Their organic form emphasizes planning and contributions of special skills and knowledge, rather than explicit rights and duties. It requires continual redefinition of individual tasks through interaction with others and involves a

wide commitment to the organization as a whole rather than to subunits. Its organizational structure is a network, rather than a hierarchical pattern of authority, control, and communication. Today, organizational planning is expected to take into account the dynamics of changing internal and external environments. At the same time a new management science technology has emerged that emphasizes decision making under conditions of uncertainty (9).

Problems With the New Planning Tools

Some of the new techniques depend upon mathematical models, probability theory, and the use of quantitative methods. We have statistical tools to estimate probabilities for the future, mathematical models such as linear programming to aid in optimizing our decisions about resource allocation, network analysis techniques such as program evaluation review technique (PERT) to aid in controlling complex operations, and program-planning-budgeting to aid in integrating all aspects of a program.

But all these tools require quantification and specificity of activity that are difficult to achieve, and this rigor often creates resistance to their use. Although the logic of the management sciences is now taught in most classes in administrative management, there still remains a nagging, almost intuitive feeling that the resistance to this rigor of specificity is reasonable and should be looked at carefully.

These management planning tools are based on an assumption that activities are involved in a complex system and attention should be placed on output rather than on structure or process. But this assumption may be overly simplistic, for we are not yet equipped with the strategies we need to apply these tools easily. In fact, we do not yet know enough about human systems to apply indiscriminately the highly valued engineering and mathematical models that have been so effective technologically.

These reservations make it imperative that we learn these new tools and techniques well so that we can apply them in appropriate situations. If we believe that man can have some mastery over his fate, then we have some exciting new tools to aid in making our decisions more rational. But to use these tools effectively, we must know their limitations.

Difficulties in specifying objectives. One difficulty usually found in the use of the new management technology is the clear specification of goals or objectives. There are many reasons for this difficulty, probably the least of which is the change in our patterns of thinking. There are other compelling reasons, such as possible loss of means for reducing the strain of value conflicts and an increased risk of loss of influence and social power (10).

Health has developed into an industry, important to the economy, during a period when its goals were widely accepted. Until technology made realizing health goals possible, as in disease eradication, public health has not been required to justify its goals of decreased deaths and disability. Despite the fact that these goals are vague and ever receding, there has been an assumption that the mere addition of more resources can reduce disease, prevent death, and so forth. Additionally, because of success in communicable disease control and in the use of new scientific knowledge, the lifespan of individuals has been increased.

However, we have not faced well the uncomfortable idea that while we have reduced deaths, we have increased chronic disability and other attendant problems of old age. Perhaps the strong, almost psychic resistance to explicit goal setting is an unconscious mechanism for protecting us from the continual stress and trauma of the value conflicts inherent in our work (11).

A second problem in specifying objectives is political. Everyone would like to believe in a fairy-tale world—a world of consensus—that willing cooperation is just around the corner. But, no matter what the extent of good will, since the world is increasingly specialized and demanding of services, there is the reality of conflicts of subunit interests, differences in personal ambitions and perceived obstacles to be surmounted, and a scarcity of resources necessitating differential control and allocation of the resources or skills of influence. This is the political reality within and between organizations. This political reality is a major barrier to the explicit specification of measurable benefits and goals. Once goals are specific, trade-offs are easy and the question is whose program will be the one to be devalued.

Thirdly, Blau has suggested that under con-

ditions of uncertainty there is a high potential of loss of power if a planned outcome is unsuccessful (12). Although high achievement results from successful risk-taking, people often prefer not to risk loss of status or power by spelling out in advance what they expect to achieve. It is easier to rationalize outcome if it has not been specified originally. In a program-planning-budgeting system and other such mechanisms, an even greater premium is placed on successful risk-taking, with strong emphasis on evaluation. It is conceivable that in the future administrators may set program objectives or goals that do not entail risk-taking or innovation. In our organizations we usually want to be known as number one, not as the one that just tried harder but didn't succeed.

Difficulties in detailing program activity. In program budgeting and in cost-effectiveness and cost-benefit analyses, it is necessary to detail program activities. In our teaching experience we find great resistance to this kind of detailed analysis. "It takes more time than doing the job," or "everybody knows that" are the kinds of complaints we hear, yet time and time again specification of details reveals differences in perception and understanding that could have been detrimental to the planned program.

Any careful analysis of the system for planning purposes requires detailed information about activities performed. But we are all familiar with the resistance that occurs whenever a time study is undertaken, even when great effort is taken to depersonalize the data. One reason for this resistance may be that specification of activities reduces the freedom of the individual. He becomes committed to a particular pattern of activity, and such commitment can be used as a strong controlling mechanism. It seems quite possible, therefore, that another resistance to specific detailing may be an unconscious or unexpressed resistance to rigid controls.

In addition, the client-oriented professional in his one-to-one relationship with his client learns to deal with uncertainty in a very special way. The physician treating a patient with certain symptoms learns first as much as he can through a history, observation of the patient, and tests, and then makes a diagnosis based on his knowledge of probabilities that certain characteristic symptoms occur with specific disease

processes. But the professional's diagnosis is always subject to change, depending upon response to treatment, progress of symptoms, and so on.

Thus, the professional uses a heuristic learning process in serving each client that enables him to apply his special knowledge to this unique and dynamic situation—he tests out a series of hypotheses over time. To reveal in advance exactly what will be done and to make contingency decisions before the contingency occurs and before information is available seems to be a major shift from the usual professional behavior. (In actuality, the physician does know the potential contingencies and watches for them.) It is essential that there be continuous feedback of adequate information to make wise decisions about detailed activities under conditions of uncertainty, but the organizational situation differs from the unique client situation in that the specification of what information will be needed must be planned for and made explicit for organizational use in decision making.

In addition to these reasons for possible resistance to specifying details, there is a great deal of tedious, time-consuming, hard work involved. It is boring and does not give the satisfaction of action, and it is much easier to shortcut specification than to go through the process. And there is a good reason for this. Bruner and co-authors (13) suggest that a person in the process of categorizing objects is likely to reduce the strain of paying attention to myriads of details since he is usually under time pressure. There are two principal ways in which the strain may be reduced—reduction in the number of attributes considered, and combining or recoding attributes into configurations. They also suggest that persons develop a taste for methods of grouping and that these are probably learned and reflect subcultural biases. Thus, the identification of activity categories as required by these new tools of the management sciences is quite a strain because of the unusual method of categorizing and the requirements for detail.

Many people have difficulty thinking in terms of specific activity output. They do maternal and child health or disease control or health education or, even more ambiguously, they integrate or coordinate. But, if asked for specific

examples of such activity, only the rare person can find a way to describe it in terms of output or benefit.

Resistance to detailed specification of activity is perhaps a natural response of people who have learned a certain method of perceptual conservation that was highly satisfactory under a different set of conditions. For example, under the usual expenditure accounting methods, attention is placed on activities rather than on results of activities. Doing what is now required for cost-utility or cost-benefit analysis is a waste of time when only simplistic efficiency criteria are used in auditing governmental activities and when dealing with innumerable uncertainties.

Politics of Program Implementation

The new tools of management are challenging, exciting, and powerful, but not for the reasons usually given by their advocates. If used wisely, there is an opportunity for the first time to promote the kind of communitywide planning dialogue that will enable societal decisions to be made more rationally. To achieve this there must be familiarity and facility in the use of these tools, which can provide the stimulation of new perceptions and new ways of thinking. For example, Shaefer and Hilleboe have applied output thinking to the manpower problem (14).

It is important not only that these tools be mastered as techniques, but also that it be known whether they are being used well or poorly by the technical expert. The systems engineers and operations research specialists have these tools and models at their fingertips for analyzing the operational problems of hospitals, governmental agencies, and industrial concerns, but these specialists may not be experts in the system to which they are applying the tools. Nothing is more important than adequate information about the operational details of the system being analyzed.

Some simplistic assumptions about health matters can be made by intelligent people. Without guidance, the uninformed systems specialist can make decisions that may reflect popular beliefs about disease processes and about activities in the health field. Today there are many systems experts now applying their knowledge

to the health field. For example, the aerospace industry has recently turned its attention to governmental and health problems, and there is a major effort to apply the space-age techniques to governmental administration as well as to health services administration in the private sector. To the uninitiated, mathematical symbols and formulas have a mystery and an aura of infallibility that, coupled with the computer's fantastic extension of man's cognitive capacity, create a barrier to learning. And, as a result, all decision responsibilities may be granted the technician by default.

Planning at the Community Level

A broad definition of planning may help to clarify the difference between planning within an organization and planning at the community level. If we define planning as those activities required to organize and implement an intervention in current patterns of activities with the purpose of achieving a different outcome (or set of outcomes) than would have occurred if there had been no intervention, we can identify four underlying assumptions within this definition. There is an assumption of an ongoing process that will result in a less desired outcome than one which might be planned, another that activity is organized and can be consciously controlled and rational, a third of purpose or a consciously desired outcome, and a fourth of deliberate choice from among alternatives.

Given these assumptions, there are two fundamentally different kinds of decisions involved in planning. The first is related to desire—it is value-laden and ethical rather than rational, inspirational rather than computational. To make these choices, it is necessary to know what the alternatives might be and the expected probability of consequences from these alternatives. These things help in making a choice, but the desired outcome must be based on the values we wish to enhance.

Once we have decided what might be preferred for the future, more rational decisions can be made, and these new decision-tools and models from cost-benefit analysis to game theory can be applied. The management tools depend upon a strong assumption that utility or benefit is a measurable commodity and that all aspects

of the system can be transformed into the same measure.

This is the point at which many of us unfamiliar with the logic become disturbed. "You can't measure pain in dollars," but it is now being done, if not from an economically rational point of view. Every time a budget is set based on last year's estimates, something is measured in dollars. When priority is given to an immunization program over screening for chronic diseases, a utility decision has been made, even though it may have been made intuitively rather than on the basis of a consciously rational decision model.

In California, and elsewhere, I presume, the technicians have been called in to solve the problems of criminal justice, welfare, transportation, waste management, and information processing under an assumption that these are analytical rather than political value problems (15). Under such circumstances, the politically wise move of the administrator is to ask for help before the legislature or governor does. This allows him to maintain control of the recommendations that result.

For the company contracting to provide the service, the logical and rational recommendation is for further study since adequate data is almost never immediately available. Further study is also to the advantage of the administrator who does not want to have the balance of influence shifted. Thus, it is to the mutual disadvantage of both the contractor and the administrator to implement suggested change. On the basis of this logic, we can expect in the near future a rash of studies without much actual change resulting.

This lack of change may be advantageous because it is questionable whether a group of systems technicians should be the only persons whose values set what government shall or shall not do. Until the program administrators understand these new techniques and learn to use them wisely in the pursuit of social values developed in a dialogue with the polity about alternatives, it may be better than some major changes are not implemented.

Perhaps the most important function of the health professional in community planning is that of finding better ways to measure benefits and delineate health values. If he does not meet

this challenge the measures of the technicians will be used, and they may represent a quite narrow value system about health. For many programs in the health field, the utilities sought are closely related to what might be defined as the "good life." Health, illness, and disease are intimately intertwined with socioeconomic status, education, geographic location, occupation, family patterns, and so forth. But what constitutes the good life for some is not even in the realm of conjecture of others, and even our personal definition changes as age, economics, or other circumstances change.

Therefore, the really troublesome problem is resolving conflicting values and clarifying and identifying shifting value premises. Rogers and Messinger (16) are attempting to develop some new methodologies for dealing holistically with this problem of system purpose. But until these methods provide a more rational base for determining utility, the problem will have to be resolved on a political rather than analytical basis.

The knotty problem to be solved in planning, whether at the organizational or the societal level, is to find a tool that will aid in defining the utilities to be maximized and the timespan that is to be considered. Management tools can help us plan how to get somewhere and learn where we are going, but they cannot help us decide where it is we want to go.

REFERENCES

- (1) Bolan, R. S.: Emerging views of planning. *Amer Inst Planners J* 33: 233-245, July 1967.
- (2) Petersen, W.: On some meanings of "planning." *Amer Inst Planners J* 32: 130-142, May 1966.
- (3) Toulmin, S., and Goodfield, J.: *The architecture of matter*. Harper & Row, Publishers, New York, 1962.
- (4) Boguslaw, R.: *The new Utopians*. Prentice-Hall, Inc., Englewood Cliffs, N.J., 1965.
- (5) Hanika, F. deP.: *New thinking in management*. Hutchinson & Co. (Publishers) Ltd., London, 1965, p. xv.
- (6) Local health departments—services and responsibilities. *Amer J Public Health* 41: 304, March 1951.
- (7) The local health department—services and responsibilities. *Amer J Public Health* 54: 135, January 1964.
- (8) Burns, T., and Stalker, G. M.: *The management*

- of innovation. Tavistock Publications, Ltd., Social Science Paperbacks, London, 1961, pp. 119-125.
- (9) Shuchman, A.: Scientific decision-making in business. Holt, Rinehart and Winston, Inc., New York, 1963.
- (10) Moore, W. E., and Tumin, M. M.: Some social functions of ignorance. *Amer Sociol Rev* 14: 787-795, December 1949.
- (11) Rogers, E. S.: Public health asks of sociology *Science* 159: 506-508, February 1968.
- (12) Blau, P.: Exchange and power in social life. John Wiley & Sons, Inc., New York, 1964.
- (13) Bruner, J., Goodnow, J. J., and Austin, G. A.: A study of thinking. John Wiley & Sons, Inc., New York, 1956, pp. 45-49.
- (14) Shaefer, M., and Hilleboe, H. E.: The health manpower crisis—cause or symptom? *Amer J Public Health* 57: 6-14, January 1967.
- (15) Hoos, I. R.: A critique on the application of systems analysis to social problems. Working paper no. 61, Space Sciences Laboratory, University of California, Berkeley, May 1967.
- (16) Rogers, E. S., and Messinger, H. B.: Human ecology: toward a holistic method. *Milbank Mem Fund Quart* 45: 25-42, January 1967.

Education Notes

Administration of Extended Care Facilities.

The graduate division of the Brooklyn College of Pharmacy has introduced a course in the administration of extended care facilities.

The new course, begun in the fall semester of 1968, was open to nonmatriculated students in the field of health services as well as to pharmacists and other registrants in the curriculums leading to a master of science degree in pharmacy administration or hospital pharmacy administration.

To cover such topics as organizational structure and controls, public relations, administrative and fiscal procedures, personnel problems, departmental services, and patient relations, the curriculum is divided into the following five phases.

Planning deals principally with general problems and procedures such as legal and insurance requirements and rehabilitation services.

Organizing covers the relationship between operational facilities and patient care and morale, the number and quality of personnel, dietary problems, recreational facilities, operating costs, and the use of charts and manuals.

Assembling resources is concerned largely with relationships with physicians, licensing agencies, social workers, and other nursing homes; and with the selection and training of the administrative assistant and the director of nursing services.

Supervising comprises scheduling, therapy, visiting, and housekeeping.

Controlling includes the development and proper use of medical and financial records and reports, maintenance and utility costs, and methods for increasing institutions' financial support.

Additional information is available from Prof. Isidore Greenberg, Chairman, Department of Hospital Pharmacy Administration, Brooklyn College of Pharmacy, 600 Lafayette Avenue, Brooklyn, N.Y. 11216.

Principles of Chemical Epidemiology.

A training course in the principles of chemical epidemiology is being sponsored by the Pesticides Program, Food and Drug Administration, Consumer Protection and Environmental Health Service of the Public Health Service. It has been scheduled for November 4-6, 1968, at the National Communicable Disease Center.

The course is designed for epidemiologists, members of epidemiologic teams in State and local health departments, and employees of private or public agencies concerned with investigation of chemical poisonings.

Presentations will include lectures and demonstrations on aspects of pesticides toxicology, chemical epidemiology, pesticide chemistry, laboratory tests used to diagnose chemical poisonings, and related topics.

Additional information may be obtained from the Chief, State Services Section, Pesticides Program, National Communicable Disease Center, Public Health Service, Atlanta, Ga. 30333.